USACE Program for the Dredging and Disposal of Sediments from the Indiana Harbor and Canal

Dave Wethington, PE
Joanne Milo, PMP

U.S. Army Corps of Engineers
Chicago District

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Presentation Outline

- History and Overview
- Contaminated Sediments
  - Nature
  - Aesthetic and Environmental Effects
- Working Toward a Solution
  - Confined Disposal Facility
  - Dredging and Disposal Plan
- Challenges and Summary

Indiana Harbor and Canal

- Man-made channel constructed in the early 1900's
- Formed new connection between Grand Calumet River and Lake Michigan
- Highly Industrialized Region
  - Steel Mills
  - Metal Processing during WWII
  - Petrochemical Processing
  - Regionally Significant Petroleum Refining

Present Day – Approach from Lake Michigan

Indiana Harbor & Canal
Present Day

- Regional economic activity only a fraction of historic prosperity
- Maintenance of Harbor and Canal has been delayed since 1972
  - Majority of water passing through is industrial outflow or stormwater overflow
  - Accumulated sediment is considered too contaminated for open water disposal
  - Awaiting environmentally and economically acceptable disposal alternative
- Between 1-2 million cubic yards of sediments have accumulated in the approximately 5 miles of navigable channels

Sediment & Water Quality Issues

- Former economic prosperity has left behind the environmentally destructive byproducts of industrial prowess
  - Oil & grease
  - Heavy metals
    - Includes arsenic, cadmium, chromium, mercury, lead, selenium, very high iron
  - Nutrients
    - Ammonia, phosphorus
  - PCBs
    - Greater than 50 mg/kg in two spots
  - PAHs
    - Total greater than 200 mg/kg in most areas
  - VOCs
  - Dioxins and furans, trace pesticides

Typical Appearance of Indiana Harbor Sediments

Environmental Effects – Aesthetic Degradation

Environmental Effects – Ecological Degradation

Environmental Effects – Fish Tumors/Lesions

Environmental Effects – Fish Deformities

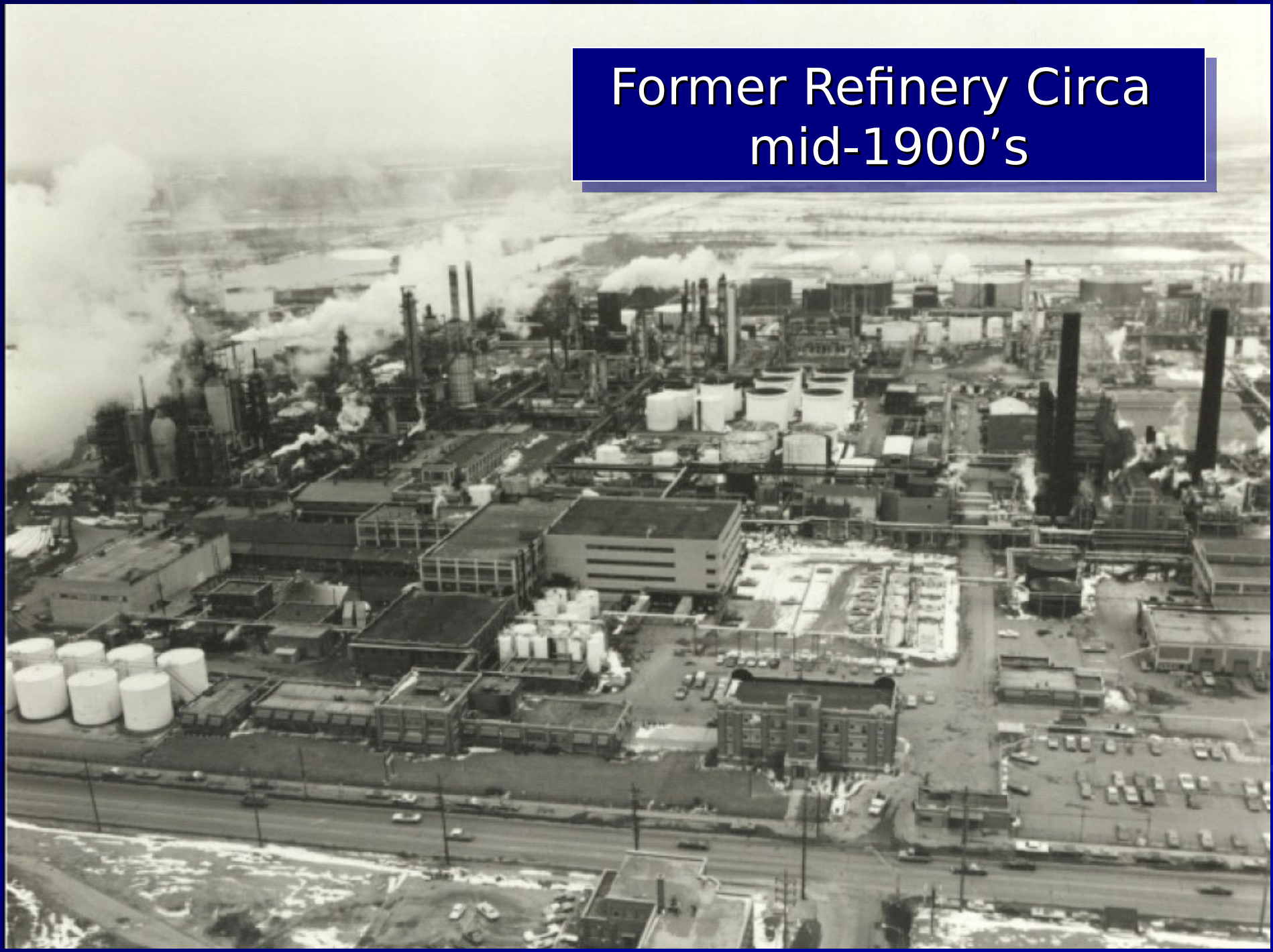
Search for the Solution
Where to place the sediments?

- Costs and logistical implications associated with transportation necessitate a location near the Harbor and Canal
  - Land must also be inexpensive to acquire
- Environmental laws require that sediment be dewatered prior to final “disposal”
- Due to elevated levels of PCBs, the disposal site will have to be TSCA permitted.
- “Greenfields” are prohibited from use by IDEM
- Local sponsor was needed to pay for a portion of the costs

The ECI Site
The Perfect Site?

- Petroleum refinery from 1918 to 1981
  - Production topped 140,000 barrels per day; some pesticides
- In 1981, Energy Cooperative Inc filed for bankruptcy
  - A RCRA permit had not been issued
- In the late 1980's a court-ordered closure ruling resulted in buildings being razed, and topsoil placement
  - Assets placed in a trust to deal with open RCRA issues
- Per RCRA, the site required corrective action and closure
  - Petroleum in groundwater and soil
- In 1989 the city of East Chicago became owner of the site
- Since 1990's oil has been observed leaking into Canal from site
  - Since 1992 ARCO has been operating booms and groundwater extraction
- In 1998 the USACE approves a Comprehensive Management Plan (CMP) identifying ECI site as optimal location for sediment confinement

Former Refinery Circa mid-1900's



ECI Site
Circa 2006

Indiana Harbor and Canal:
Project Objectives

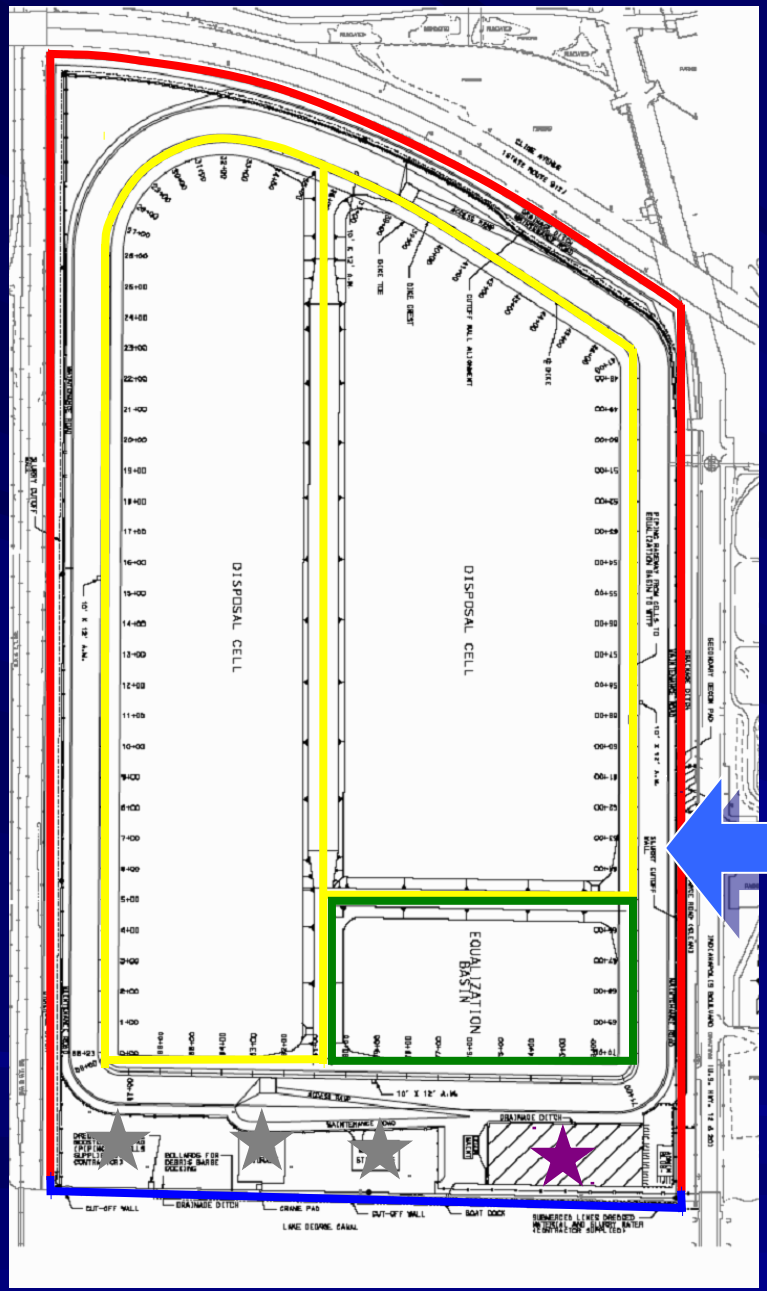
1. Restore and maintain the navigable depth of Indiana Harbor and its channels
2. Insure that dredging and disposal activities do not pose an unacceptable risk to the environment or human health during, between, and after implementation
3. Perform the dredging and disposal in a cost-effective manner

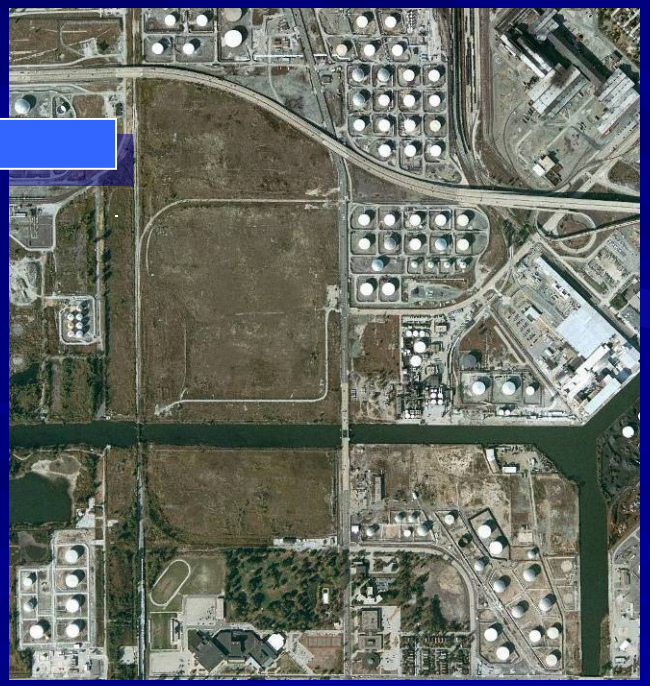
How to Achieve the Objectives

- Design and construct a facility capable of handling up to 4.8 million cubic yards of dredged material
- Develop a plan and schedule to dredge and deliver the sediment to the facility
- Establish environmental monitoring plans for all aspects of the operation to protect the health of humans and the environment
  - Air monitoring
  - Ground and surface water monitoring
  - Site worker and community health and safety plans
- Continually reevaluate methods and practices, as appropriate, to ensure that efficiencies are achieved wherever possible

CDF Features

- Slurry Wall – 30 ft depth
- South Cutoff Wall
- Disposal Cells – 91 acres
- Equalization Basin – 10 acres
- Wastewater Treatment

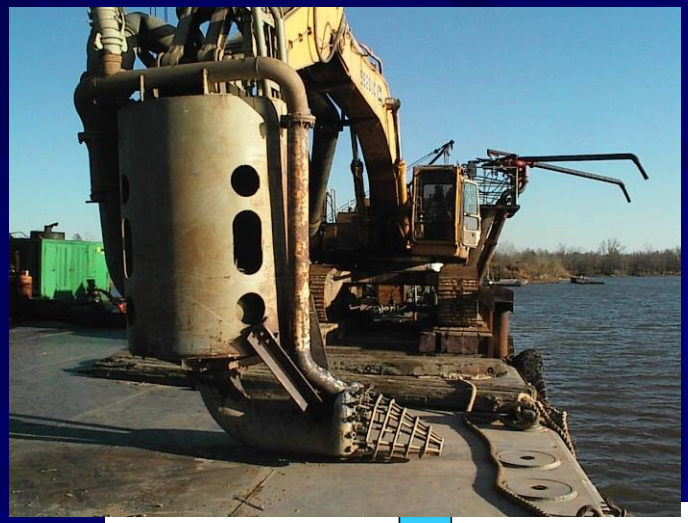


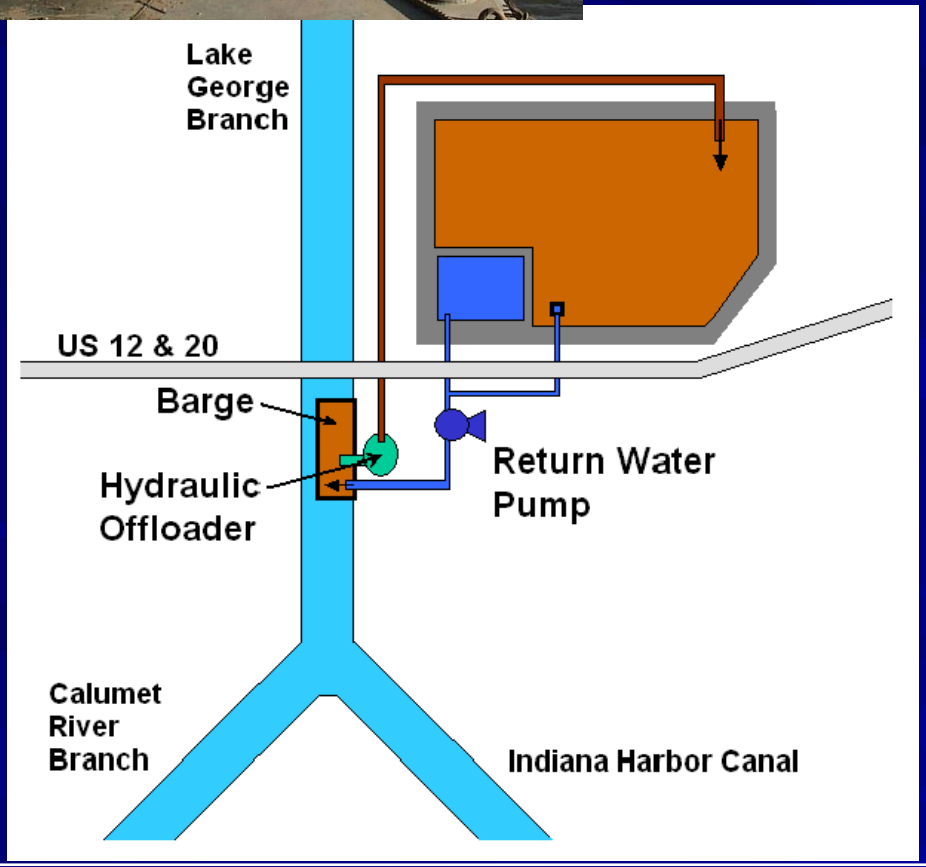


- Equipment Storage
- Admin Facil
- Parking

Dredging Plan

- Mechanically dredge contaminated sediments
- Remove backlog material in a series of annual projects over an anticipated 10-yr period
- Maintain the depth of the channels using periodic maintenance dredging projects over the following 20-year period

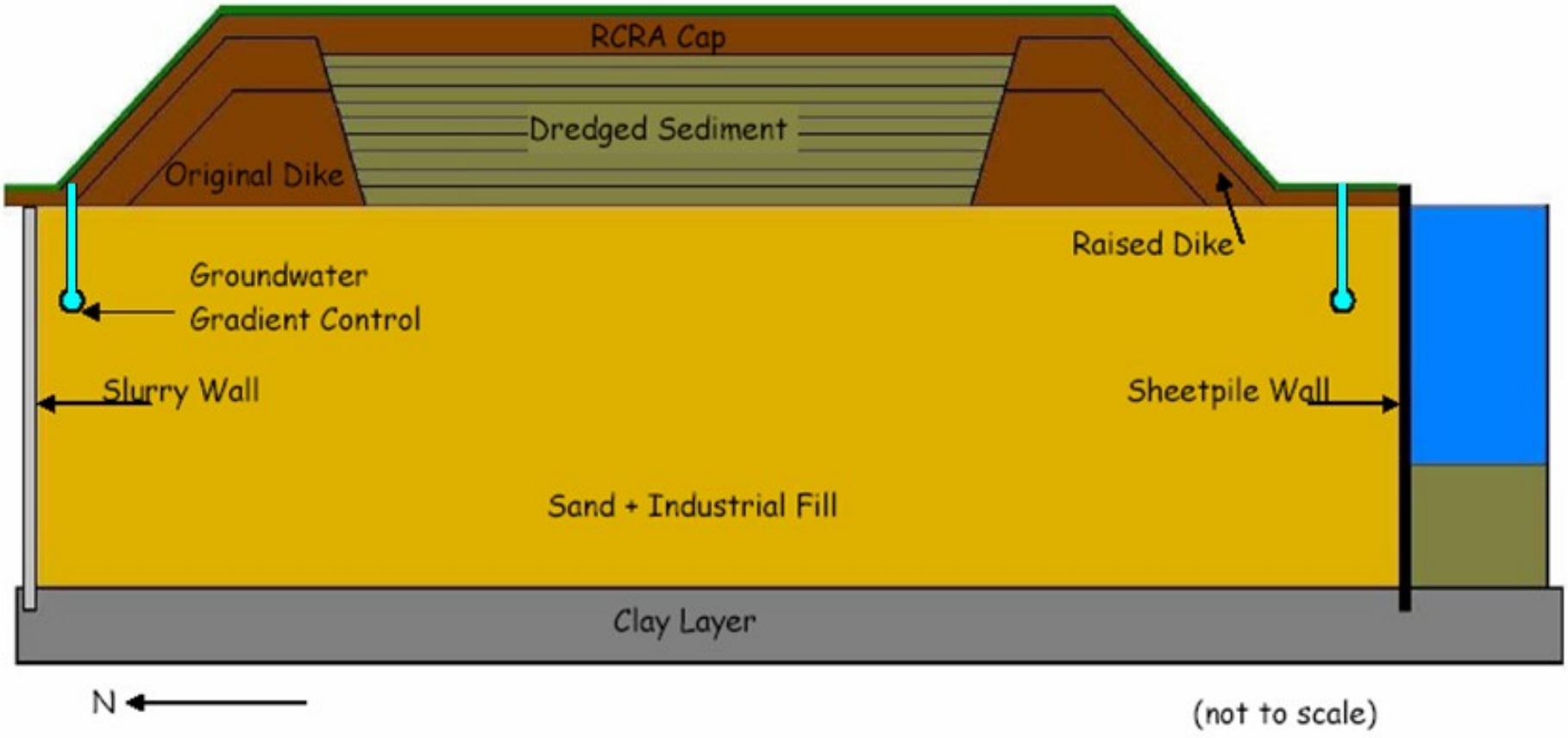




Disposal Plan

- Hydraulically offload dredged material from barges into CDF
- Recirculate CDF site water to slurry material to minimize water to be treated
- Prioritize bottom coverage to seal the CDF and decrease seepage infiltration
- Collect and treat all water seasonally

Cross-Section of Capped CDF



Challenges

- Design
  - Project site “unknowns” such as underground obstructions
  - Treatment of water for discharge
- Operational
  - Dewatering and drying material to maximize storage capacity
  - Volatilization of contaminants and dust control
- Public Concern
  - Environmental monitoring to ensure health and safety of the community

Project Status & Contact Information

- Completed to date:
  - Slurry wall
  - Majority of perimeter dikes
  - Design of groundwater gradient control system
  - Design for south cutoff wall
- Next Steps:
  - Complete CDF construction
  - Continue to develop facility operation and monitoring plans
  - Continue to inform and involve the community
- Project Contact:

Joanne Milo, PMP
USACE Project Manager

Joanne.M.Milo@usace.army.mil
312.846.5558